Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

1. (currently amended) A method of identifying ~~nucleic acid~~ biological samples comprising:

providing a micro-array including a substrate coated with a composition including a population of ~~nucleic acid~~ biological probe modified micro-spheres immobilized in a coating containing a gelling agent or a precursor to a gelling agent, wherein a first portion of the micro-spheres is submerged in the ~~gelatin~~ coating and a second portion is exposed above the ~~gelatin~~ coating and is substantially free of ~~gelatin~~ a gelling agent or a precursor to a gelling agent, at least one sub-population of said population micro-spheres containing an optical barcode generated from at least one colorant associated with the micro-spheres and including a ~~nucleic acid~~ biological probe sequence;

contacting said array with a ~~fluorescently/chemiluminescently labeled nucleic acid~~ biological sample labeled with one of a fluoresent or chemilumiscent label target ~~nucleic acid sequence~~; and

detecting the ~~color~~ optical barcode of said sub-population of micro-spheres due to the interaction of said biological probe ~~nucleic acid sequence~~ and said ~~fluorescently/chemiluminescently~~ labeled ~~nucleic acid~~ biological sample target ~~nucleic acid sequence~~ ; and

identifying the biological sample from said detected optical bar code.

2. (currently amended) The method of claim 1 wherein said micro-array population of micro-spheres includes a plurality of sub-populations of micro-spheres, wherein each said sub-population of micro-spheres obtains a unique optical barcode and has a unique probe ~~nucleic acid sequence~~.

3. (original) The method of claim 1 wherein said optical barcode is generated by two or more colorants.

4. (original) The method of claim 1 wherein said optical barcode is generated by a mixture of red (R), green (G), and blue (B) colorants.

5. (currently amended) The method of claim 1 wherein said at least one sub-population of micro-spheres has a luminescent property to produce a luminescent image and wherein said detecting includes:

(a) whole frame imaging capture of the luminescent image resulting from said interaction of said biological probe ~~nucleic acid sequence~~ and said ~~fluorescently/chemiluminescently~~ labeled ~~nucleic acid~~ biological sample target ~~nucleic acid sequence~~ to produce a first image;

(b) whole frame imaging capture of said microarray under bright field illumination to obtain micro-sphere color signature/barcode image to produce a second image; and

(c) processing said first and second images to obtain identification of said ~~nucleic acid~~ biological sample.

6. (original) The method of claim 5 wherein said processing uses a pattern recognition algorithm to obtain said identification.

7. (currently amended) The method of claim 1 wherein said at least one sub-population of micro-spheres has a fluorescent property and wherein said detecting includes:

(a) whole frame imaging capture of the fluorescent image resulting from said interaction of said biological probe ~~nucleic acid sequence~~ and said fluorescently/chemiluminescently labeled ~~nucleic acid~~ biological sample target ~~nucleic acid sequence~~ to produce a first image;

(b) whole frame imaging capture of said micro-array under bright field illumination to obtain micro-sphere color signature/barcode image to produce a second image; and

(c) processing said first and second images to obtain identification of said ~~nucleic acid~~ biological sample.

8. (original) The method of claim 1 wherein said substrate is characterized by an absence of specific sites capable of interacting physically or chemically with the micro-spheres.

9. (currently amended) The method of claim 1 wherein said micro-spheres bear surface active sites which contain said ~~nucleic acid~~ probe.

10 (original) The method of claim 1 wherein said micro-spheres have a mean diameter between 1 and 50 microns.

11. (original) The method of claim 1 wherein said micro-spheres have a mean diameter between 3 and 30 microns.

12. (original) The method of claim 1 wherein said micro-spheres have a mean diameter between 5 and 20 microns.

13. (original) The method of claim 1 wherein said micro-spheres in the composition are immobilized on the substrate in a concentration between 100 and 1 million micro-spheres per cm^2.

14. (original) The method of claim 1 wherein said micro-spheres in the composition are immobilized on the substrate in a concentration between 1000 and 200,000 micro-spheres per cm^2.

15. (original) The method of claim 1 wherein said micro-spheres in the composition are immobilized on the substrate in a concentration between 10,000 and 100,000 micro-spheres per cm^2.

16. (original) The method of claim 1 wherein said micro-spheres comprise a synthetic or natural polymeric material.

17. (original) The method of claim 16 wherein said polymeric material is an amorphous polymer.

18. (original) The method of claim 17 wherein said amorphous polymer is polystyrene.

19. (original) The method of claim 1 wherein said micro-spheres contain a polymeric material and less than 30 weight percent of a crosslinking agent.

20. (currently amended) The method of claim 1 wherein said micro-spheres have the property of being ~~are~~ prepared by emulsion polymerization or limited coalescence.

21. (currently amended) A method of identifying ~~nucleic acid~~ biological samples comprising:

providing a microarray including a substrate coated with a composition including a population of micro-spheres immobilized at random positions on the substrate, at least one sub-population of said population of micro-spheres containing an optical ~~bar~~ bar code generated from at least one colorant associated with the micro-spheres, having one of a luminescent or fluorescent property and including a ~~nucleic acid~~ biological probe ~~sequence~~;

~~contracting said array~~ contacting said microarray with a ~~fluorescently/chemiluminescently labeled nucleic acid~~ biological sample target ~~nucleic acid sequence~~ having a corresponding luminescent or fluorescent property; and

detecting the ~~color~~ optical bar code of said sub-population of micro-spheres due to the interaction of said biological probe ~~nucleic acid sequence~~ and said ~~fluorescently/chemiluminescently labeled nucleic acid~~ biological sample target ~~nucleic acid sequence by~~ to produce a corresponding luminescent or fluorescent image;

(a) whole frame imaging of the luminescent or fluorescent image resulting from said interaction to produce a first image;

(b) whole frame imaging capture of said microarray under bright field illumination to obtain micro-sphere color signature/barcode image to produce a second image; and

(c) processing said first and second images to obtain identification of said identification of said ~~nucleic acid~~ biological sample.

22. (original) The method of claim 21 wherein said processing uses a pattern recognition algorithm to obtain said identification.

23. (currently amended) The method of claim 21 wherein said microarray population of micro-spheres includes a plurality of sub-populations of micro-spheres, wherein each said sub-population of micro-spheres contains a unique optical barcode and has a unique biological probe ~~nucleic acid sequence~~.

24. (original) The method of claim 21 wherein said optical barcode is generated by two or more colorants.

25. (original) The method of claim 21 wherein said optical barcode is generated by a mixture of red (R), green (G), and blue (B) colorants.